

FIG.1A

FIG.1B

(PRIOR ART)

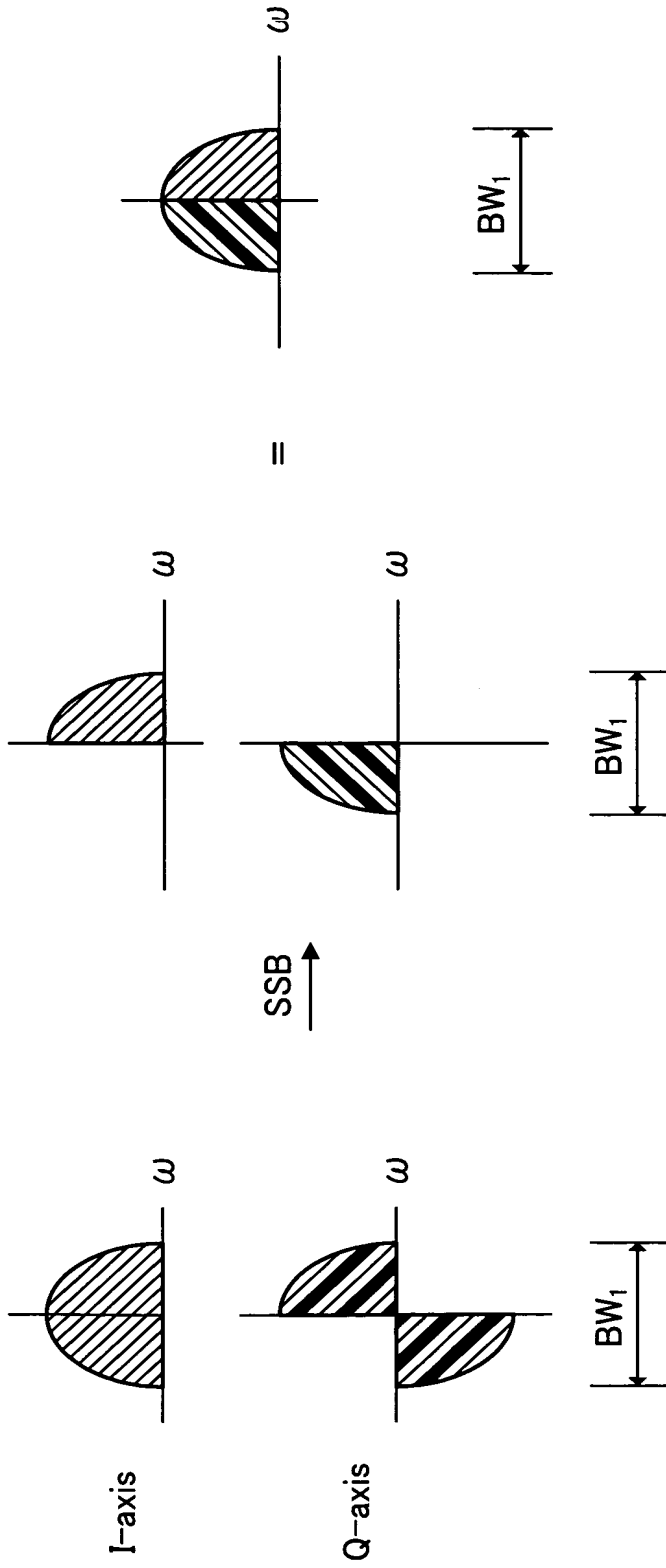


FIG.2A Basic QPSK

FIG.2B SSB QPSK

FIG.2C

(PRIOR ART)

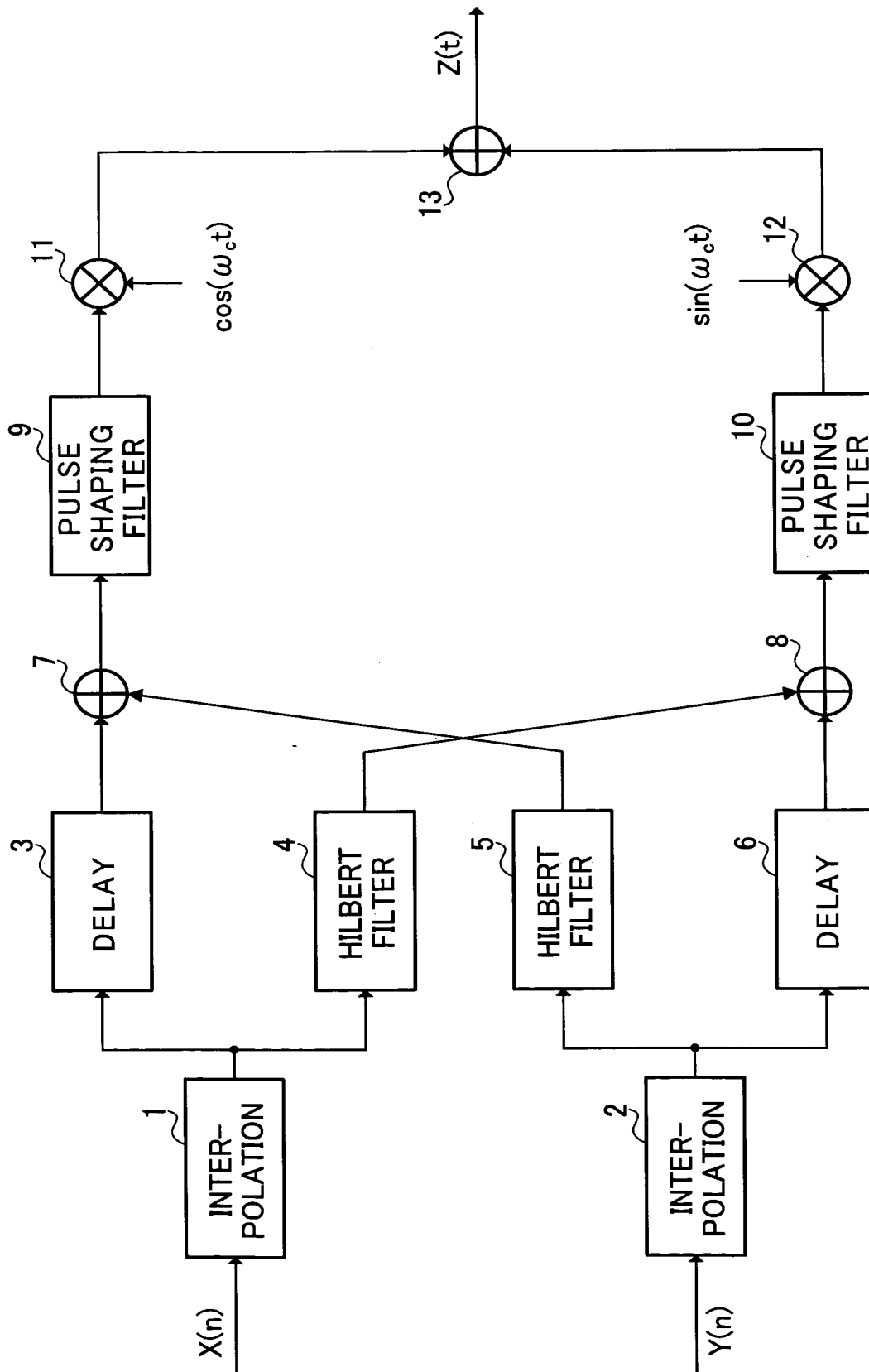
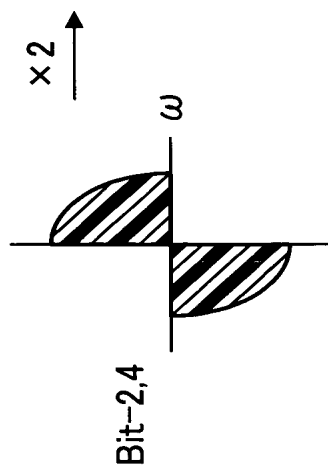
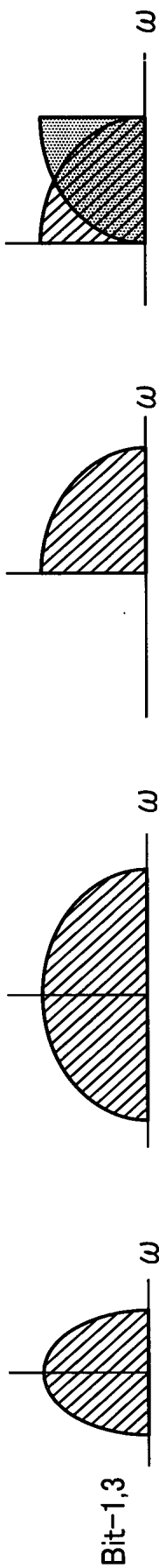
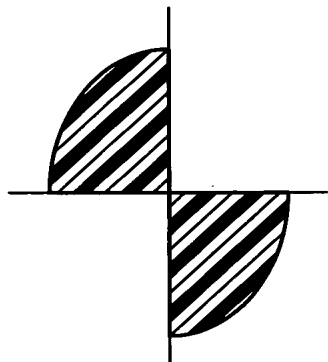


FIG.3 (PRIOR ART)

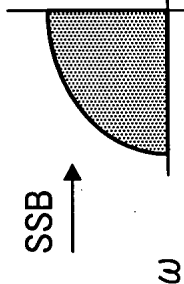


BW_1



double-rate QPSK

FIG.4A



double-rate SSB



double-rate, frequency
multiplexed SSB

FIG.4C

FIG.4D

100 MODULATION APPARATUS

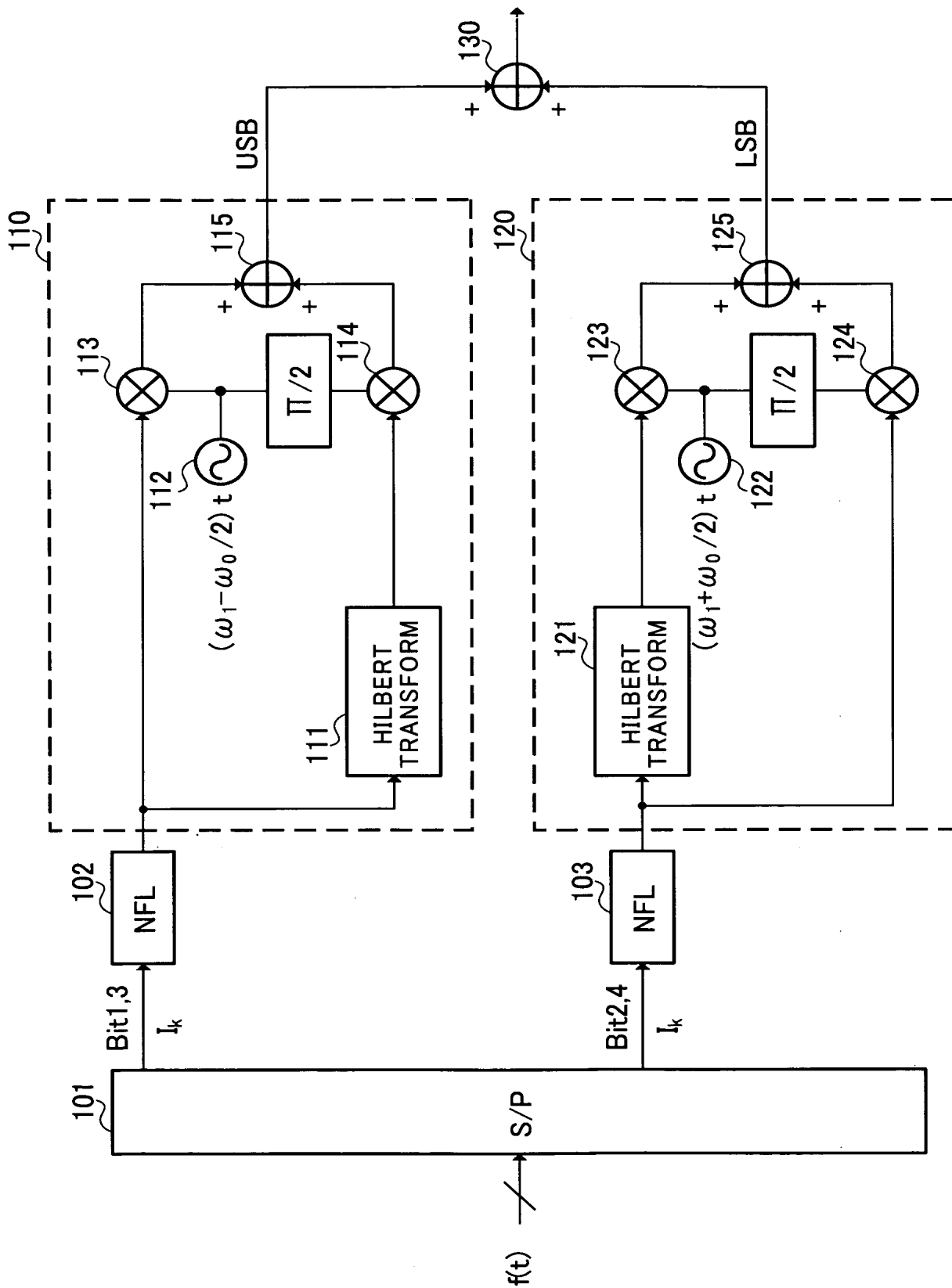


FIG.5

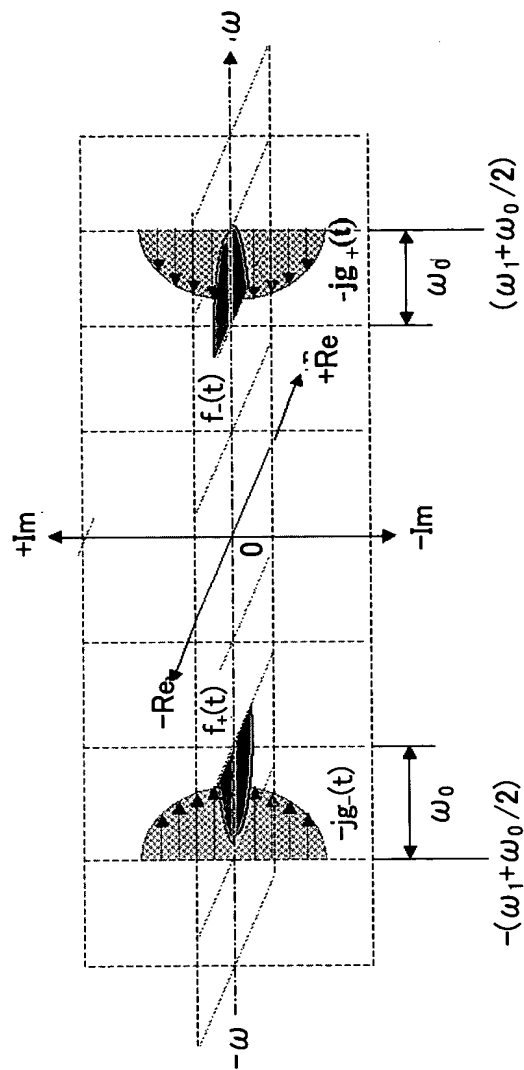


FIG. 6C

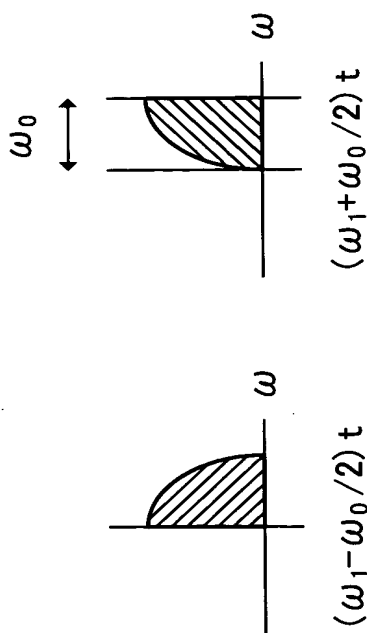


FIG. 6B

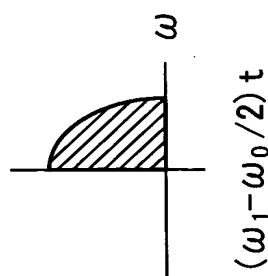


FIG. 6A

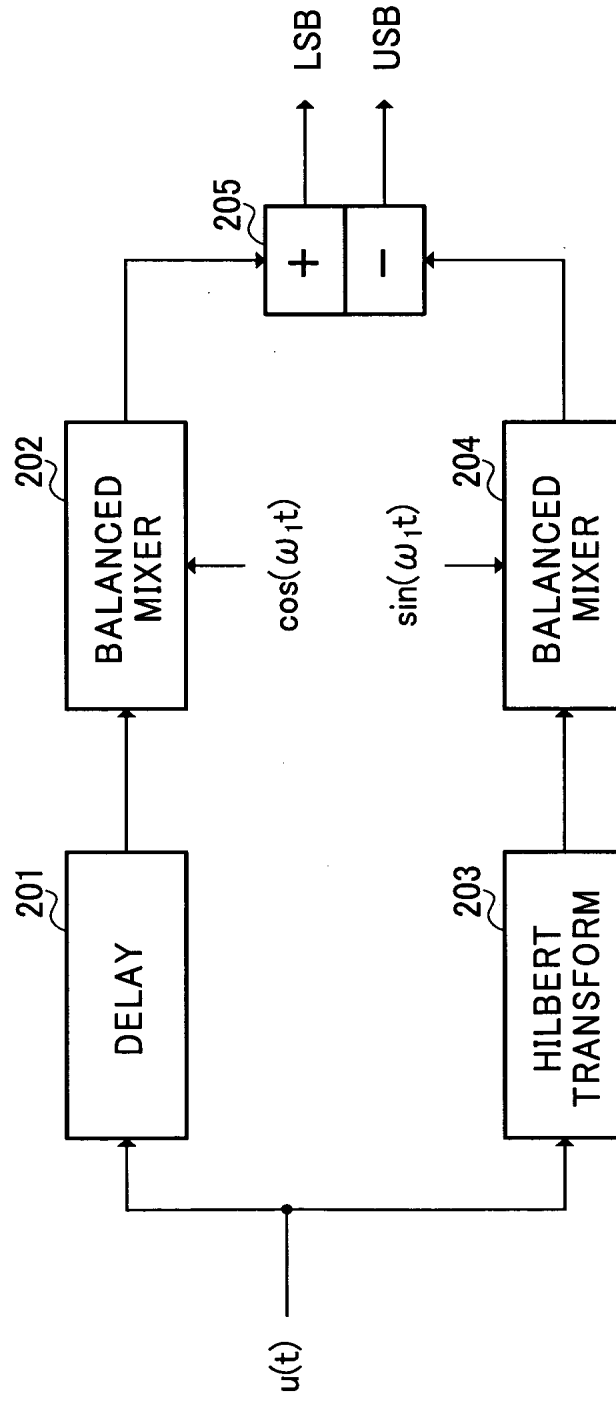
200 PHASE-SHIFT TYPE SSB MODULATOR

FIG.7

FIG.8A

$$u(t) (= v_{\text{even}}(t) + v_{\text{odd}}(t))$$

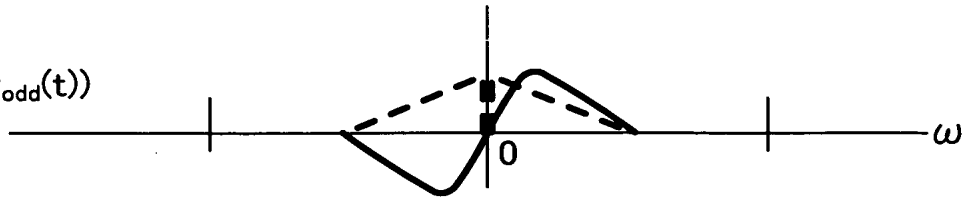


FIG.8B

$$H[u(t)] (= j \cdot u'(t))$$

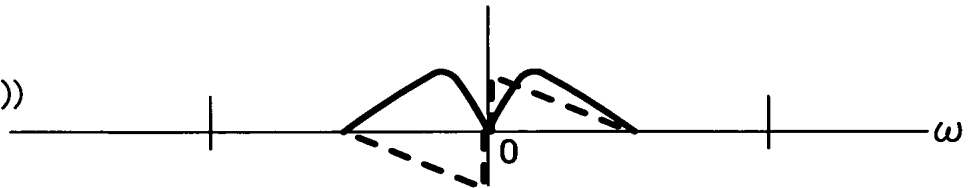


FIG.8C

$$u(t) \times \cos \omega_1 t$$

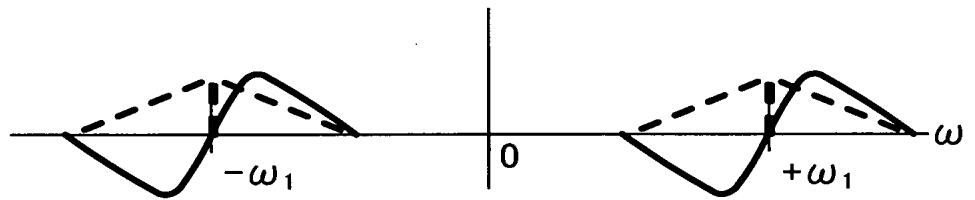


FIG.8D

$$u'(t) \times \sin \omega_1 t$$

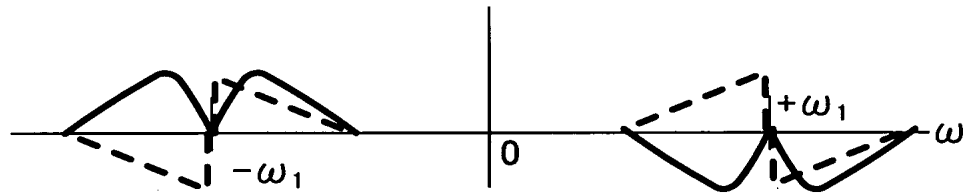


FIG.8E

$$\begin{aligned} \text{SSB (USB)} = & \\ & u(t) \times \cos \omega_1 t - \\ & u'(t) \times \sin \omega_1 t \end{aligned}$$

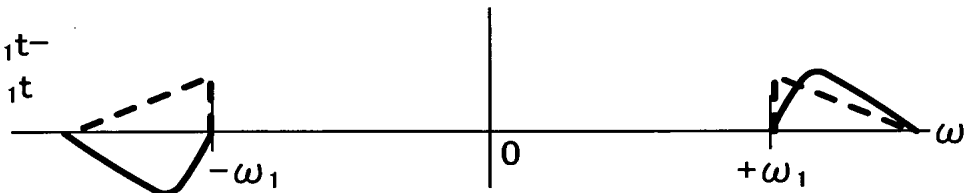


FIG.8F

$$\begin{aligned} \text{SSB (LSB)} = & \\ & u(t) \times \cos \omega_1 t + \\ & u'(t) \times \sin \omega_1 t \end{aligned}$$

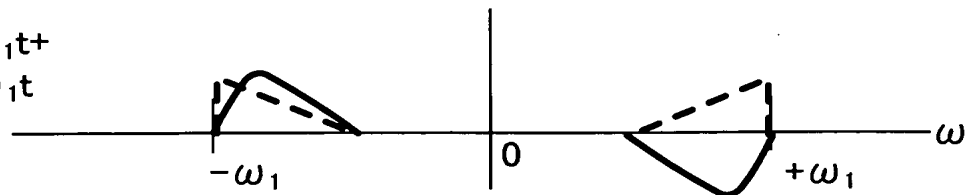


FIG.9A

$$v_{\text{even}}(t)$$

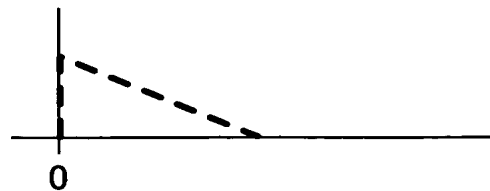


FIG.9B

$$v_{\text{odd}}(t)$$

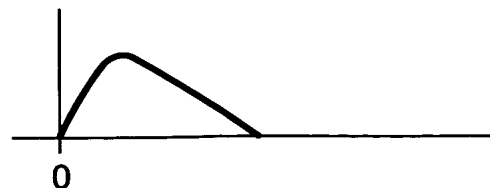


FIG.10A

SSB (USB)

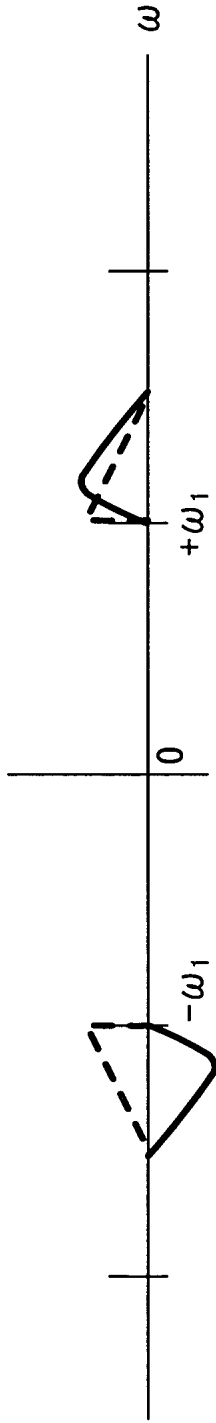


FIG.10B

USB $\times \cos \omega_1 t$

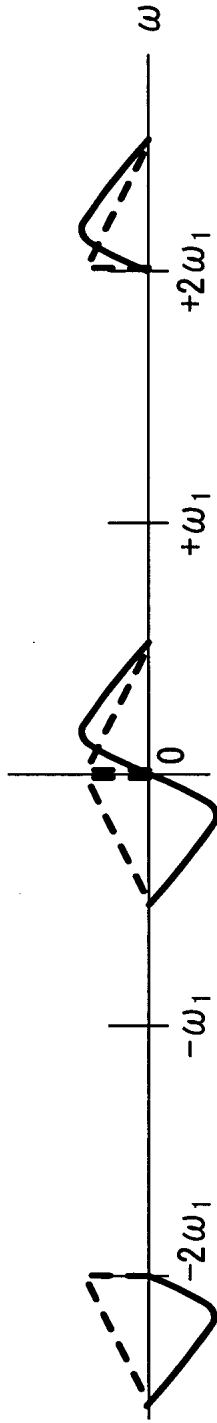


FIG.10C

SSB (LSB)

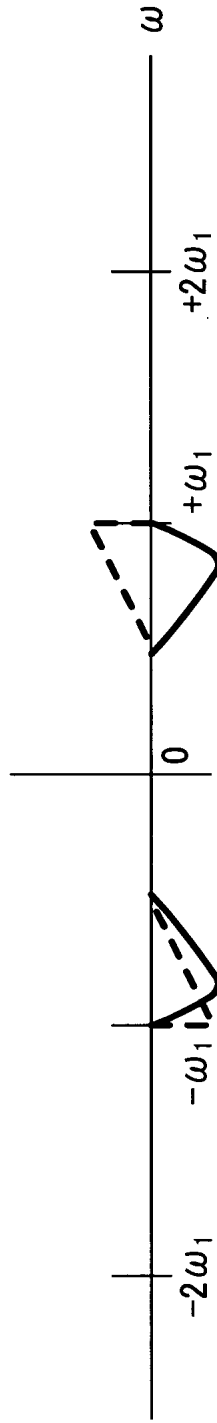


FIG.10D

LSB $\times \sin \omega_1 t$

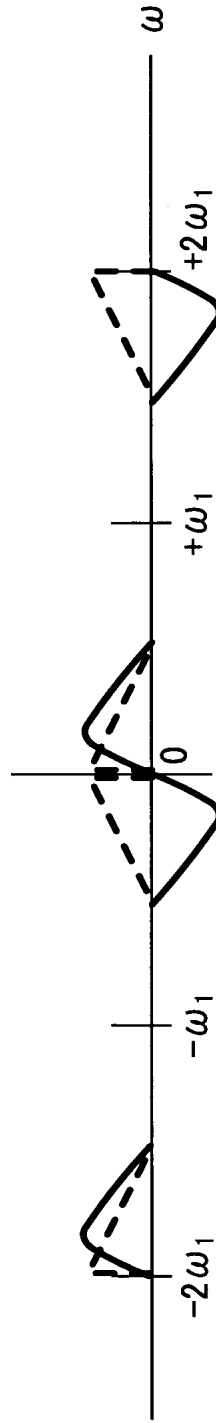
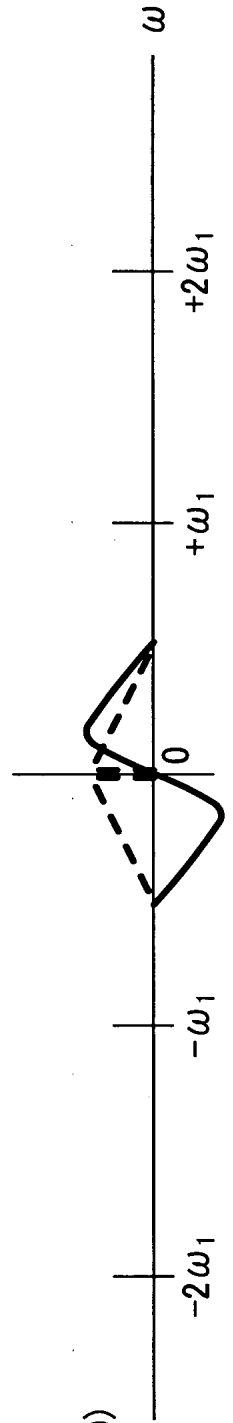


FIG.10E

After LPF

$u(t) (= v_{\text{even}}(t) + v_{\text{odd}}(t))$



300 DEMODULATION APPARATUS

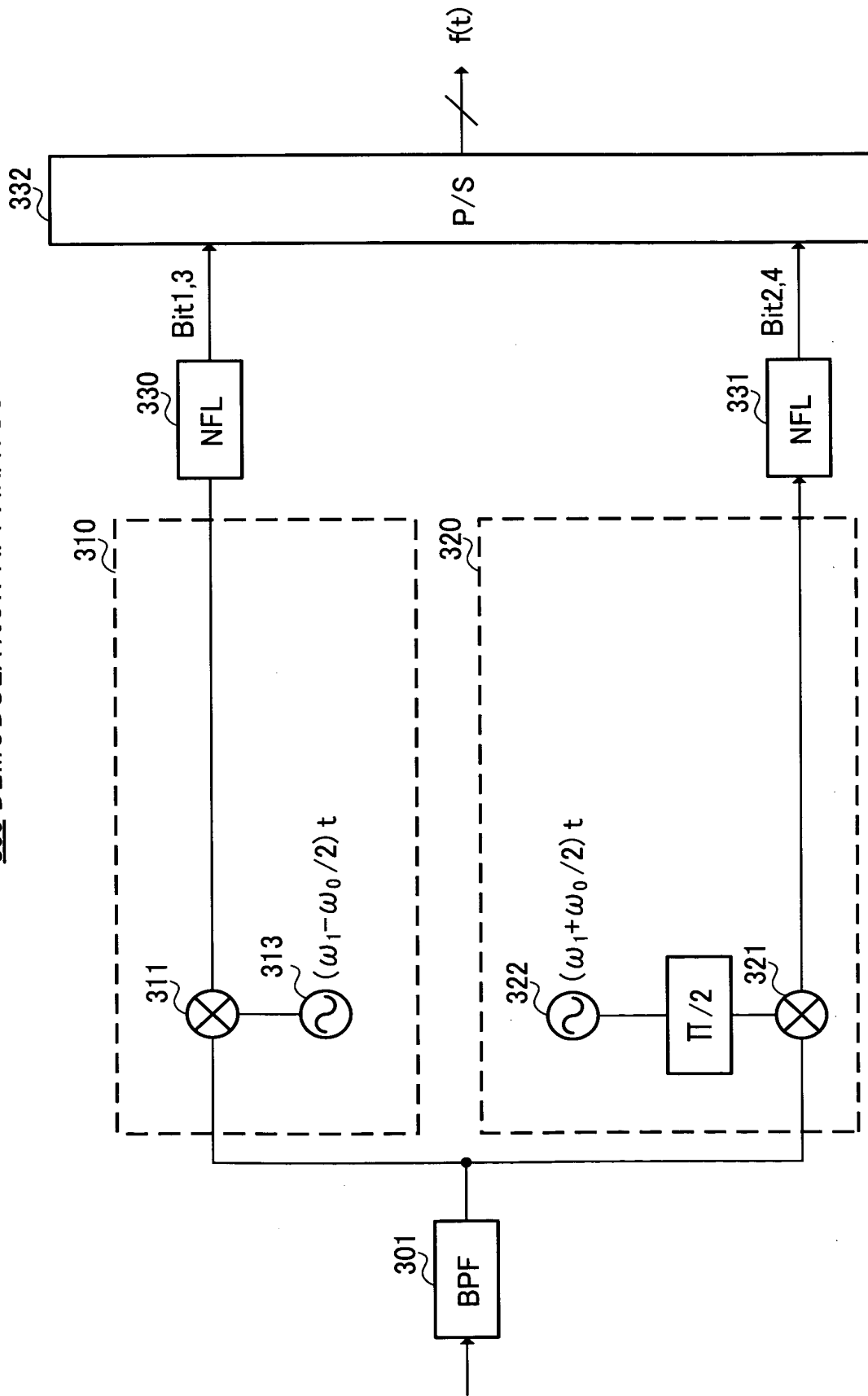


FIG.11

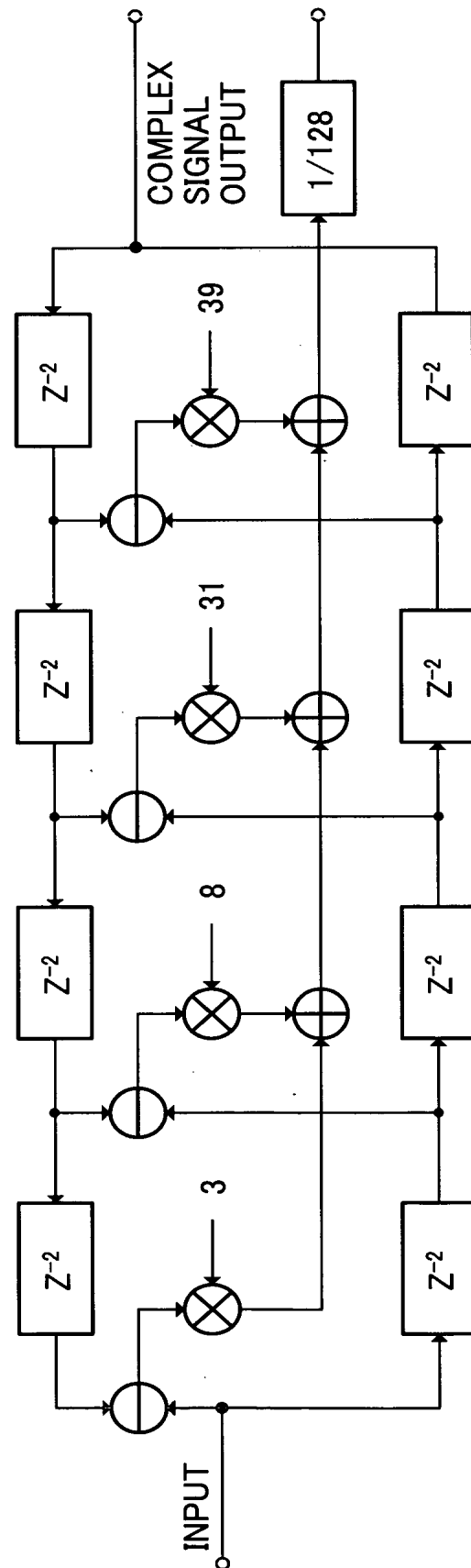


FIG.12

12/23

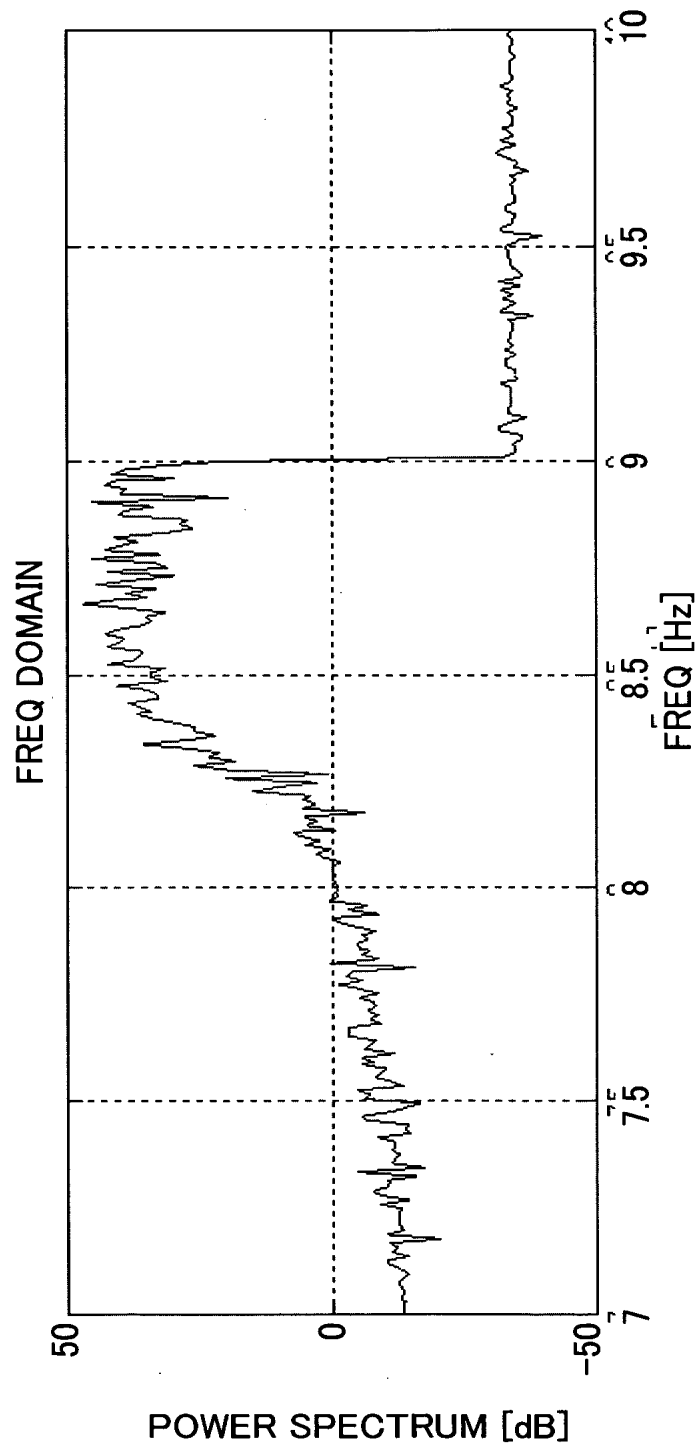


FIG.13

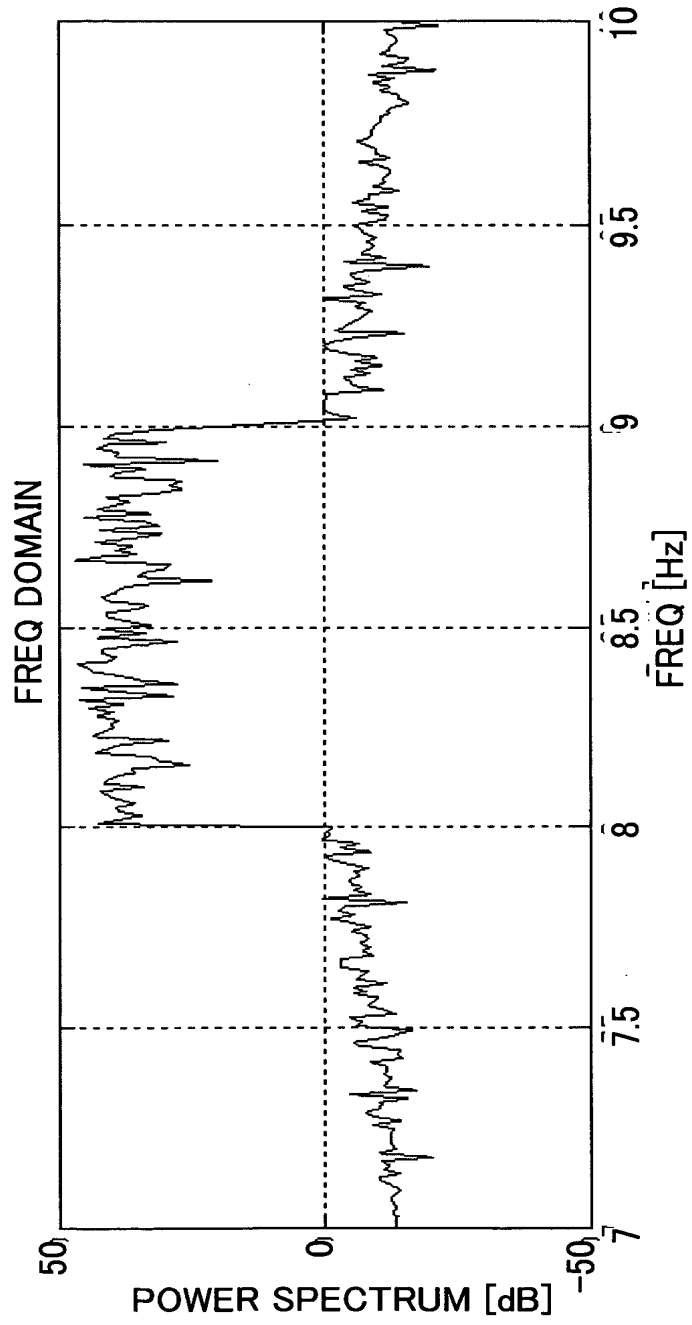


FIG.14

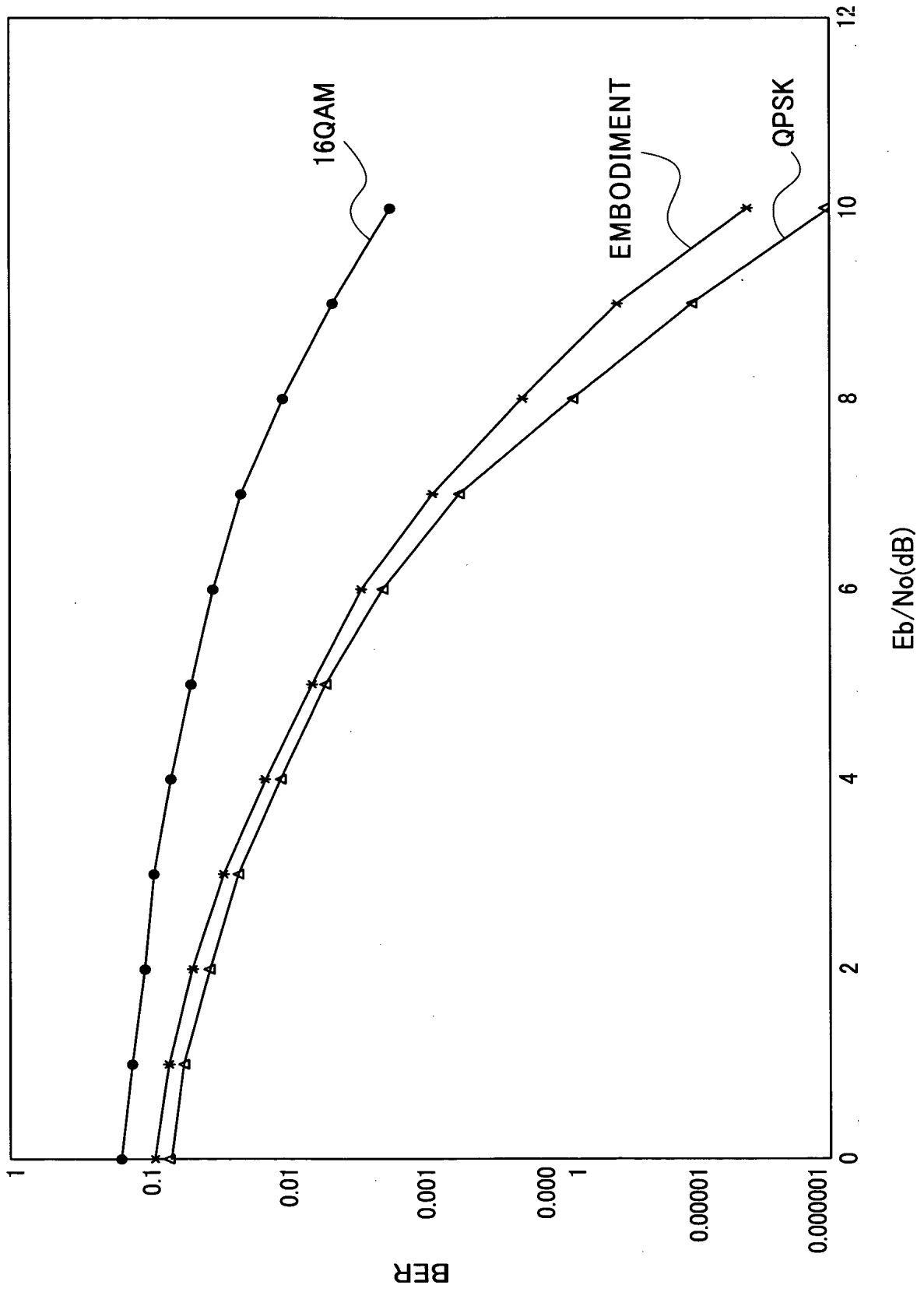


FIG.15

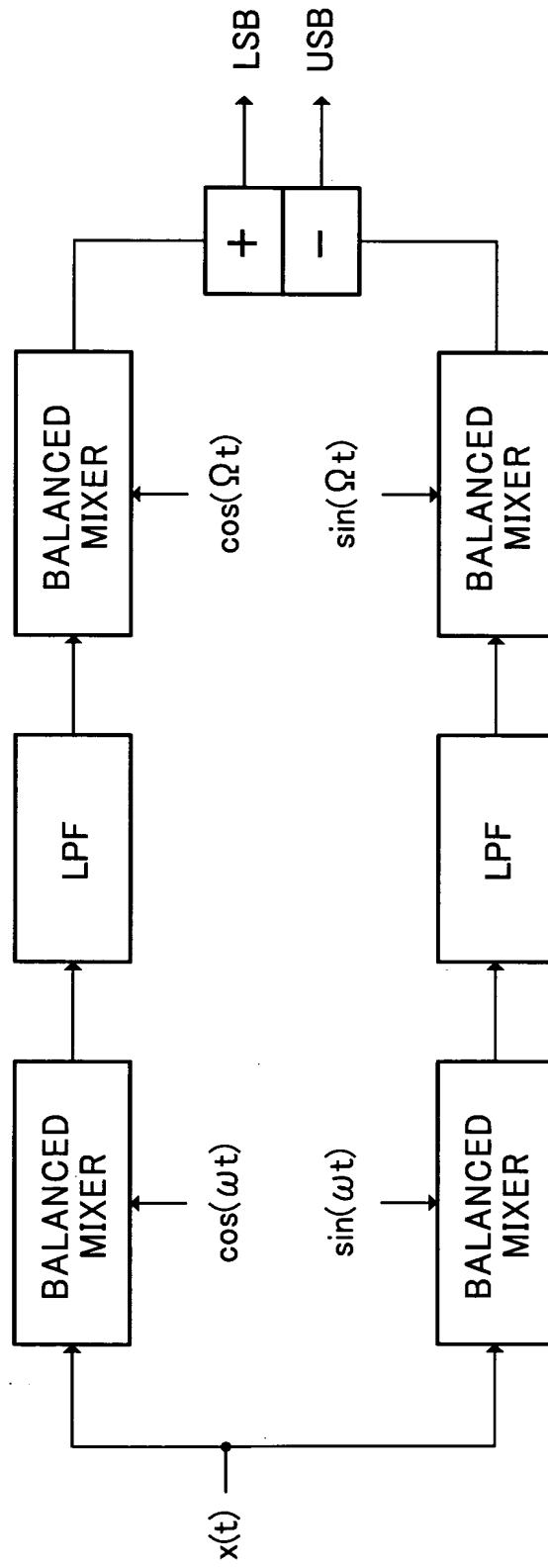


FIG.16

FIG.17A

LSB

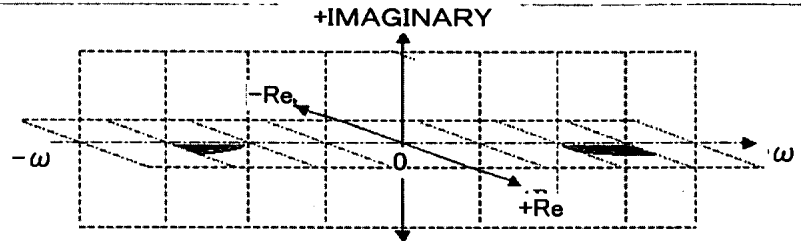


FIG.17B

USB

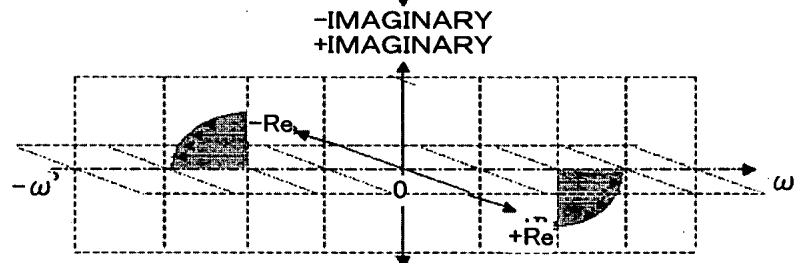
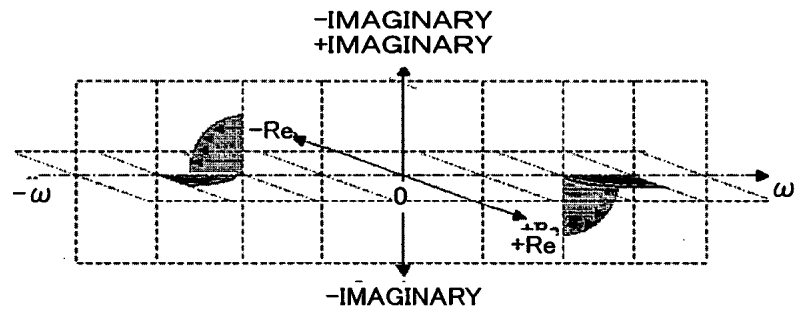


FIG.17C

LSB
+
USB

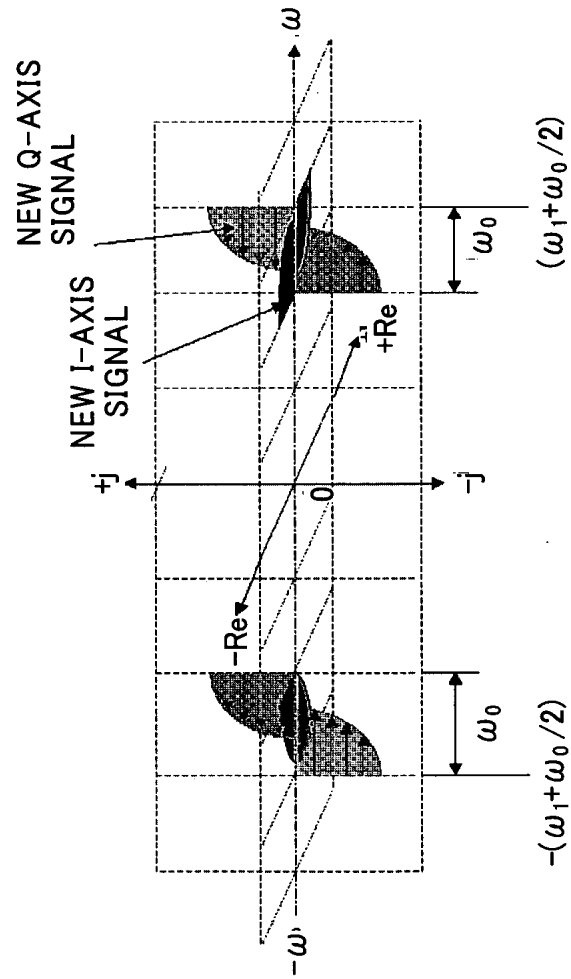


FIG.18

400 MODULATION APPARATUS

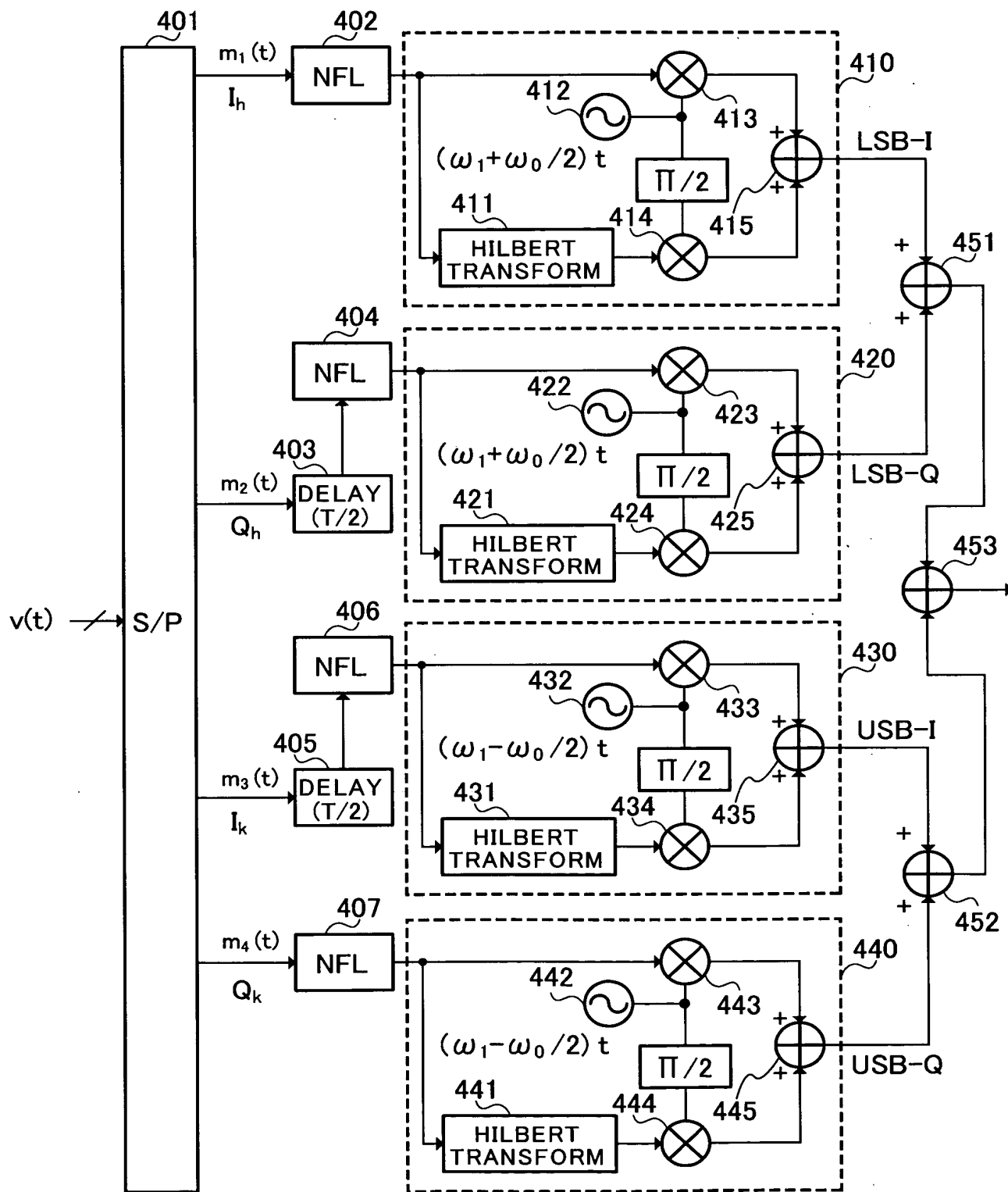


FIG.19

500 DEMODULATION APPARATUS

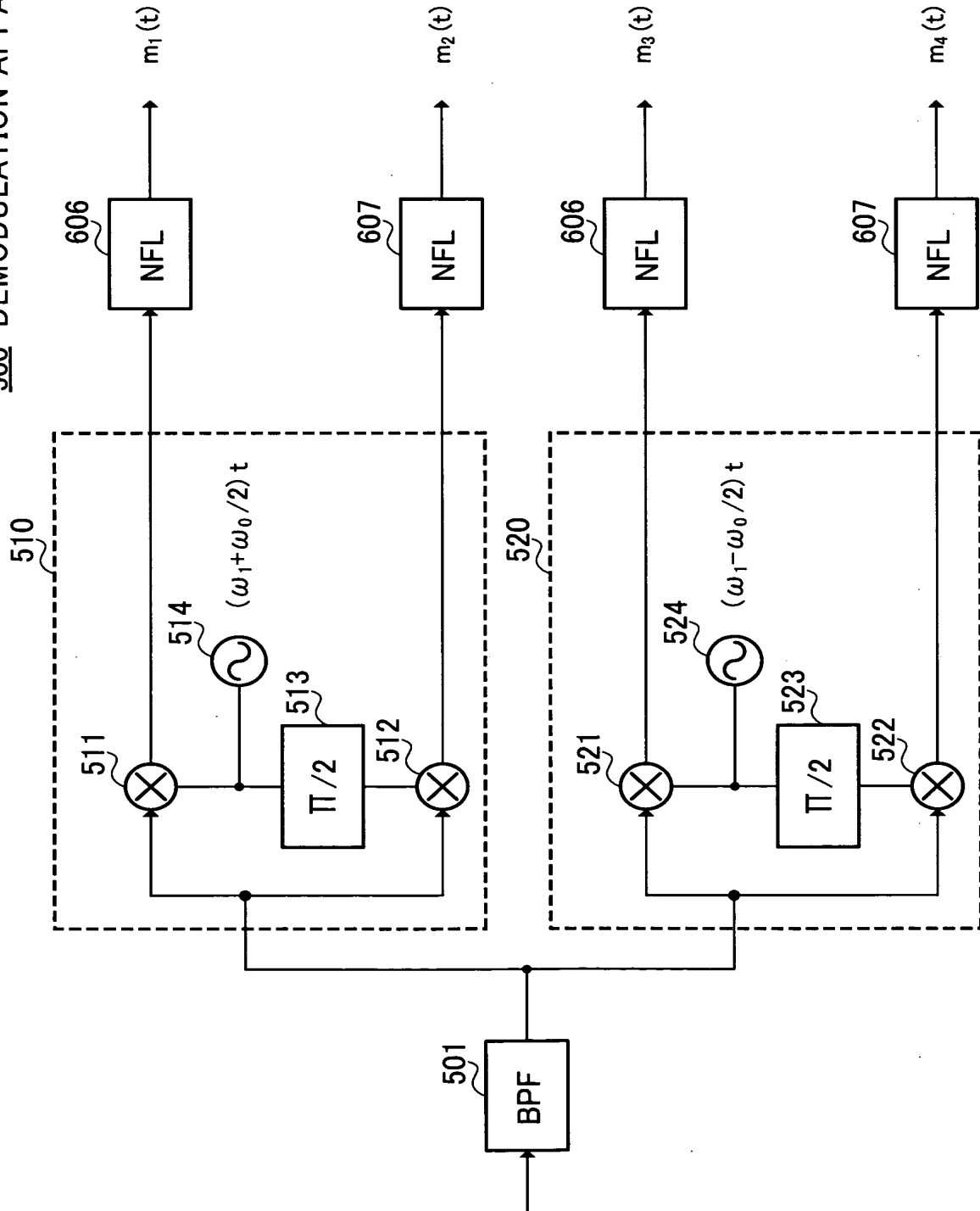


FIG.20

600 DEMODULATION APPARATUS

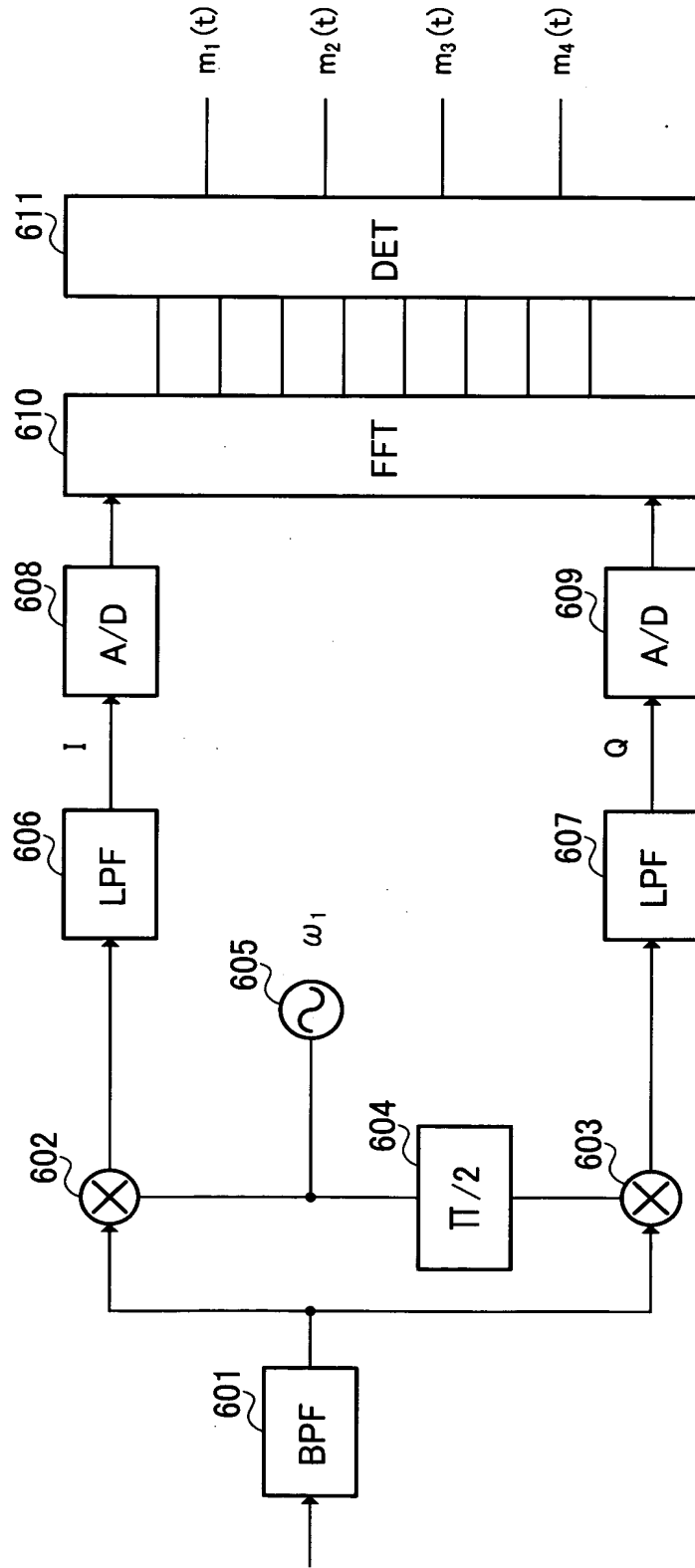


FIG.21

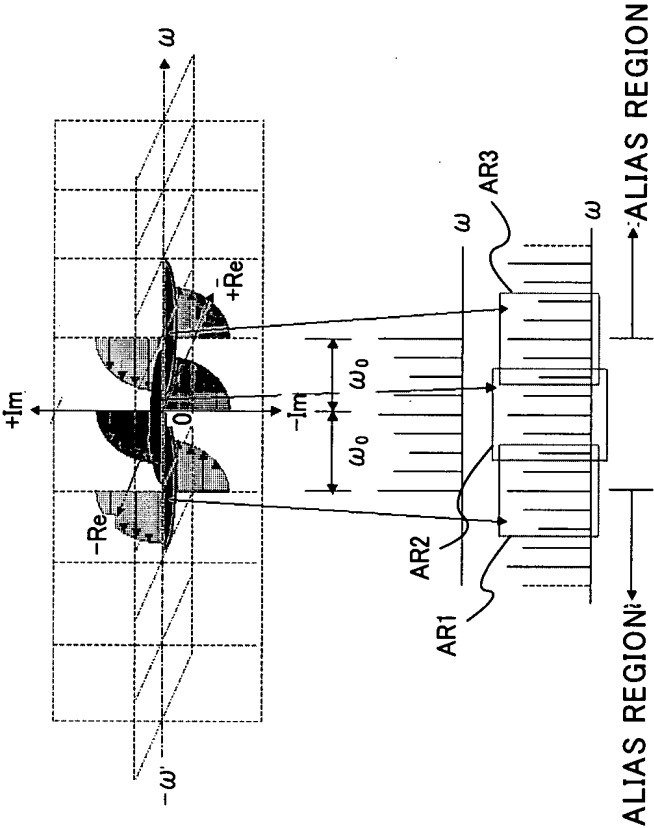


FIG.22A

FIG.22B

FIG.22C

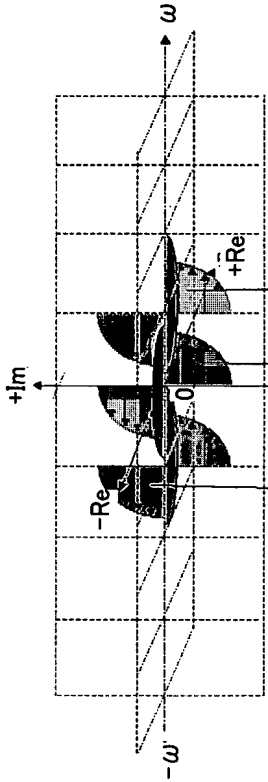


FIG.23A

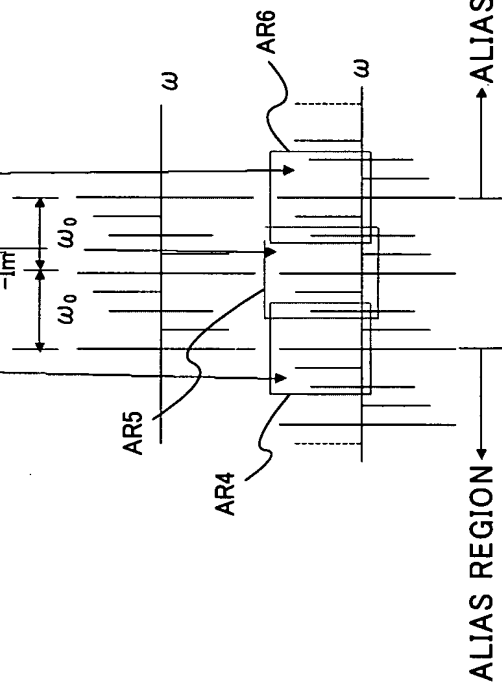


FIG.23B

FIG.23C

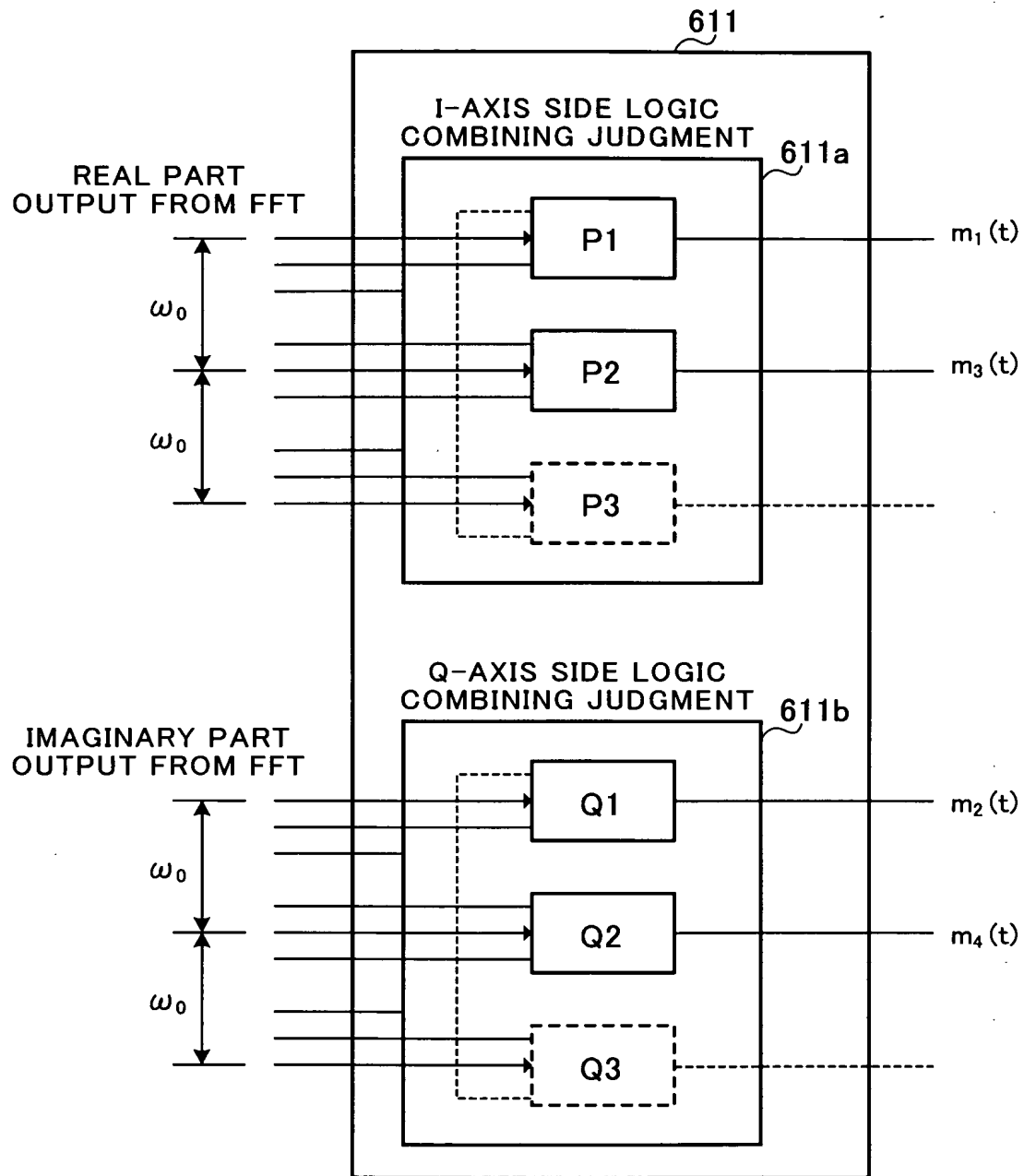


FIG.24